

REMARKS

Claims 1-20 remain under active prosecution in the present application. Applicant respectfully asserts that all amendments are supported by the original disclosure and do not introduce new matter. Moreover, Applicant further respectfully asserts that the amendments merely clarify the scope of the claims.

In an office action mailed October 2, 2006 (“Office Action”), the patent office rejected each outstanding claim of U.S. Application No. 10/803,700. Claims 1-4, 6-10, 15-16 and 18-20 were rejected under 35 U.S.C. § 102(e) as anticipated by U.S. 6,996,261 (“deCharms”). Claims 5 and 11 were rejected under 35 U.S.C. § 103(a) as being obvious over deCharms. Claims 12-13 and 17 were rejected under 35 U.S.C. § 103(a) as obvious over deCharms in view of U.S. 4,706,665 (“Gouda”). Claim 14 was rejected under 35 U.S.C. § 103(a) as being obvious over deCharms in view of Gouda and further in view of U.S. Patent 5,546,472 (“Levin”). For at least the reasons set forth below, applicant traverses the outstanding rejections and requests that the pending claims be allowed in their current form.

Turning to claim 1, applicant notes that that claim recites the limitations of “performing an image processing operation to determine coordinates of a Talairach anterior commissure (AC) – posterior commissure (PC) reference line within the diagnostic image,” limitations which are not taught or suggested in deCharms. The sections of deCharms cited in the Office Action as teaching those limitations, col. 86, ll. 14-17, 33-44 and 65 do not teach or suggest performing an image processing operation to determine coordinates of a Talairach AC-PC reference line. Rather, those sections teach an operator selecting an area of interest in a standard coordinate system brain, e.g., the Talairach Atlas (col. 86, ll. 14-17), the operator selecting a variety of points in a subject’s brain which correspond to points in the pre-defined standard coordinate brain (col. 86, ll. 35-38), and the computer displaying a point in the standard brain as a target presented above the subject’s actual brain as a background (col. 86, ll. 40-44). Applicant submits that the deCharms method of determining coordinates is very different from that required by the subject limitations of claim 1 because the deCharms method determines coordinates using manual selection by an operator, while the invention of claim 1 determines coordinates using an image processing operation. Indeed, applicant submits that deCharms explicitly teaches that the coordinates are determined by manual selection by an operator (not by

an image processing operation), and notes that deCharms recites that, after the deCharms invention displays the anterior commissure on the standard reference brain, “[t]he device operator then mouseclicks the point on the anterior commissure on the actual section of the brain of the subject as seen in the background section” (deCharms, col. 86, ll. 47-50). Consequently, deCharms does *not* teach or suggest performing an image processing operation to determine coordinates of a Talairach AC-PC reference line within the diagnostic image.

Since, as set forth above, applicant believes that claim 1 as originally filed recites limitations not taught or suggested by the prior art of record, applicant has amended claim 1 to make explicit that the image processing operation is automated, thereby clarifying the distinction set forth above between the prior art of record and claim 1. Applicant asserts that no new matter has been introduced by the amendment to claim 1, and that support for that amendment can be found in at least paragraph 41 of the application as originally filed. Thus applicant submits that the rejection of claim 1 should be withdrawn, and that that claim should be allowed in its present form.

Turning to claim 11, applicant notes that that claim recites the limitations of “identifying a line passing through a hard palate on the midline sagittal head MRI image” and “approximating the Talairach AC-PC reference line as about 12 degrees more extended than the hard palate.” The Office Action rejected claim 11 as obvious over deCharms, even though deCharms concededly does not teach approximating the Talairach AC-PC reference line as about 12 degrees more extended than the hard palate (*see* Office Action, page 5). The Office Action supported its rejection of claim 11 by stating that “deCharms does cite using anatomical scans to locate any region of interest (col. 44, ll. 11-12) and further discloses the nasion as an appropriate landmark in subject positioning (col. 35, ll. 66-67)” (Office Action, pages 5-6). The Office Action also argued that “the AC-PCP reference line being 12 degrees more extended than the hard palate would be inherent in proper patient positioning for a midline sagittal head scan” (Office Action, page 6). Applicant traverses the Office Action’s citations and inherency arguments, and additionally notes that approximating the Talairach AC-PC reference line as about 12 degrees more extended than the hard palate in a midline sagittal head MRI image runs directly counter to the accepted wisdom in the art.

First, regarding the Office Action's citations, applicant submits that deCharms' disclosure of landmarking a subject using the nasion (bridge of the nose), as set forth in lines 66-67 of column 35 of deCharms does not teach or suggest the identification of a line passing through a hard palate on the midline sagittal head MRI image as recited in claim 11 for at least the reason that the bridge of the nose and the hard palate are totally different structures. By way of support for this assertion, applicant draws the Examiner's attention to RUSSELL T. WOODBURN, ESSENTIALS OF HUMAN ANATOMY (Oxford University Press, 5th ed. London 1973), a highly respected medical reference, which includes the following description of the hard palate and nasion: "The hard palate forms the arched roof of the mouth and consists of a hard and a soft palate. The hard palate is composed of the palatine processes of the maxillae and, united posteriorly to them, the horizontal portions of the palatine bones." (pp 231-232); "At the root of the nose, the frontonasal suture separates the corresponding bones, its midpoint being the nasion." (pp 265-266). As can be seen from those passages, the nasion is a totally different structure from the hard palate, meaning that landmarking a subject using the nasion is totally different from identifying a line passing through the hard palate and using that line to approximate the Talairach AC-PC line. Consequently, identifying a line through the hard palate is not taught or suggested by a disclosure of identification of the nasion.

Second, regarding the Office Action's inherency argument, applicant notes that, even if it were inherent that the AC-PC reference line is 12 degrees more extended than the hard palate, such inherency does not teach or suggest "approximating the Talairach AC-PC reference line as about 12 degrees more extended than the hard palate." Applicant notes that, "to establish inherency, the extrinsic evidence must make clear that the missing descriptive matter is *necessarily* present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill" (MPEP § 2112(IV) quoting *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999) (emphasis added)). Applicant submits that, even if deCharms did teach or suggest identifying a line passing through the hard palate, such identification would not make inherent using that line to approximate the AC-PC reference line as is recited in claim 11 because, according to the teaching of deCharms, any landmark can be used for positioning the subject. For example, line 66 of col. 35 through line 2 of col. 36 of deCharms teaches that the nasion (bridge of the nose) can itself be used as the standard zero position, thus showing that

approximating the AC-PC reference line using the hard palate is not necessary to, and therefore is not inherent in, the disclosure of deCharms.

Third, applicant notes that, in addition to the arguments set forth above, approximating the Talairach AC-PC reference line as about 12 degrees more extended than the hard palate would not have been obvious to one of skill in the art at the time of the invention because such approximation was contrary to the accepted wisdom in the art at the time of the invention, which is evidence of non-obviousness (*see* MPEP § 2145(X)(D)(3)). In support of that claim, applicant notes that Fleckenstein P, Trantum-Jensen J., **Principles and Techniques**, In: Anatomy in Diagnostic Imaging 2nd ed., Philadelphia: WB Saunders; 2001, page 50, a highly respected reference in the art states “in axial tomographic imaging of the head, the standard tomographic planes are parallel to the *orbito-meatal plane*, which is defined by the lateral canthus of the eye and the center of the external auditory meatus; both easy to identify,” clearly indicating that, prior to applicant’s invention, the conventional wisdom was to use a plane *parallel* to the orbito-meatal plane, rather than identifying a line passing through the hard palate and then approximating the Talairach AC-PC reference line as being about 12 degrees more extended than (and therefore not parallel to) the hard palate. Indeed, applicant notes that until the applicant’s investigation and related publication, “CT Brain Prescriptions in Talairach Space: A New Clinical Standard” (AJNR Am J Neuroradiology 25:233-237, February 2004), the relationship between the hard palate and the Talairach AC-PC reference line had not been reported. Applicant also notes that proper positioning for a midline sagittal head scan requires correction for roll and yaw but not pitch (x-rotation, i.e. rotation about an axis along the left-right direction) [See Weiss et al., Clinical Brain MRI Prescriptions in Talairach Space: Technologist-and Computer-Driven Methods, AJNR 24:922-929, May 2003]. Consequently, “approximating the Talairach AC-PC reference line as about 12 degrees more extended than the hard palate,” as is recited in claim 11, would not have been obvious to one of ordinary skill in the art at the time of the invention.

Thus, for at least the reasons set forth above, applicant requests that the rejection of claim 11 be withdrawn, and that that claim be allowed.

Turning to claim 15, applicant notes that that claim recites the limitations of “an image processor operably configured to determine coordinates of a Talairach anterior commissure (AC) - posterior commissure (PC) reference line within the diagnostic image and to define a coordinate system of the diagnostic image with reference to the Talairach AC-PC reference line.” Applicant additionally notes that the Office Action stated that those limitations were taught by image reconstruction software and software associated with Talairach mapping, disclosed, respectively, in lines 1-2 of col. 26 and lines 1-10 of col. 45 of deCharms (*see* Office Action at 4). However, upon reviewing those sections of deCharms, applicant submits that those sections teach, at most, that deCharms discloses software which can transform Talairach coordinates from a computer generated brain atlas using a given 3-D spatial mapping to yield the corresponding locations in a subject’s brain. However, those sections do not teach or suggest how to obtain the required 3-D spatial mapping, let alone teaching that the 3-D spatial mapping might be obtained through an image processor. Indeed, applicant notes that deCharms teaches that the mapping is derived, not using a spatial processor, but through the identification of points by a human operator. Particularly, applicant notes that lines 33-37 of column 86 of deCharms disclose that, after a diagnostic image has been obtained, “The transform from standard coordinates to the coordinates of a particular subject being measured must then be defined. *This takes place by the user designating a variety of points on the subject’s brain that will be used to correspond these points to the pre-defined coordinate brain*” (emphasis added). Thus, instead of using an image processor to determine coordinates of a Talairach AC-PC reference line as recited in claim 15, deCharms teaches determining coordinates, not through using an image processor, but through manual selection of points by an operator. Therefore, applicant requests that the rejection of claim 15 be withdrawn, and that that claim be allowed in its present form.

Turning to claim 18, applicant notes that that claim recites the limitations of “a program configured to receive a diagnostic image of a patient’s brain and to determine coordinates of a Talairach anterior commissure (AC) - posterior commissure (PC) reference line within the diagnostic image and to define a coordinate system of the diagnostic image with reference to the Talairach AC-PC reference line.” Applicant further notes that the Office Action argued that the disclosure that a previously identified AC-PC region of interest is saved numerically to some form of memory, supposedly contained in lines 41-52 of col. 31 of deCharms, taught those

limitations from claim 18. However, having reviewed lines 41-52 of column 31 of deCharms, applicant notes that that section simply does not address how coordinates of an AC-PC reference line in a diagnostic image are determined. As set forth previously, deCharms teaches those coordinates being determined by being manually input by an operator, rather than by using software as recited in claim 18. Therefore, regardless of whether deCharms recites the saving numeric information in some form of memory, because it discloses only human selection for determining the coordinates of the Talairach AC-PC reference line within a diagnostic image, it does not teach or suggest the limitations of claim 18. Consequently, applicant submits that the rejection of claim 18 should be withdrawn, and that claim should be allowed in its present form.

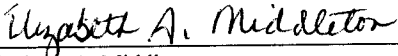
Applicant notes that, as all claims not explicitly discussed in this paper depend from the above claims, each claim in the present application includes limitations not taught or suggested in the prior art of record. Further, applicant notes that the Office Action did not cite any teaching or suggestion in any other prior art reference sufficient to remedy the above identified deficiencies of deCharms, nor did the Office Action cite any motivation to modify deCharms to remedy the deficiencies set forth above. Therefore, the rejections of each pending claim should be withdrawn, and all pending claims should be allowed for the reasons set forth above. To the extent that applicant has not addressed certain aspects of the present rejection, please do not construe the same as an admission as to the merits of the rejections. Indeed, applicant reserves all rights with respect to arguments not explicitly raised herein.

To the extent that the pending claims are directed to patentable subject matter, but can not be allowed because of omission of one or more limitations which would distinguish them from the prior art, applicant invites the Examiner to suggest one or more appropriate limitations to distinguish the pending claims from the prior art of record, and thereby to potentially reach agreement as to the patentability of the claims. Applicant notes that the MPEP is explicit that it is important for the Examiner not to overlook the importance of allowing claims which properly define an invention, and that, as the Examiner's action should be constructive in nature, when possible the Examiner should offer definite suggestions to assist the applicant (*see* MPEP § 706).

CONCLUSION

In light of the amendments and remarks made herein, it is respectfully submitted that the claims currently pending in the present application are in form for allowance. Accordingly, reconsideration of those claims, as amended herein, is earnestly solicited. Applicant encourages the Examiner to contact his representative, David Franklin at (513) 651-6856 or dfranklin@fbtlaw.com.

Since the number of claims has not changed from the claims filed and the amendment is being filed within the three month period, no fees are believed due. However, the Commissioner for Patents is hereby authorized to charge any deficiency or credit any overpayment of fees to Frost Brown Todd LLC Deposit Account No. 06-2226.

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